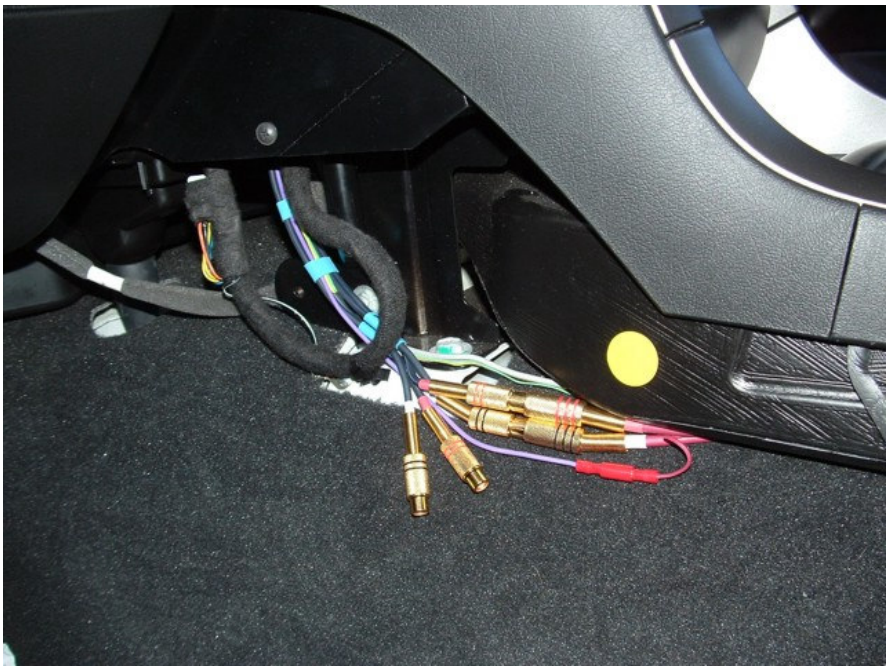
VY-VZ Commodore
Blaupunkt audio system

Low-level output conversion / Auxiliary Input
Installation Instructions



Introduction:

The procedures outlined in this document are intended as a guide to assist in the installation and modification to allow buffered line level outputs and/or Auxiliary Input. There are people of many different skill levels out there, and the instructions have been formulated to cater to many different levels. Whilst something may seem mundane and obvious to you, it may not be to everyone. I do encourage reading through the procedure entirely and to clear up any points of uncertainty before commencing.

The job entails the mounting of one or two small PCBs (Printed Circuit Board) and attachment of an additional socket inside the head unit, and the cutting of a small slot into the cradle metalwork to facilitate mounting of the pins which mate with the socket. The kit consists of a small PCB containing the buffer components, the additional socket, a lead-out cable assembly terminated with gold RCA sockets and a bullet connector, a guide template to assist with the positioning of the slot which is to be cut into the cradle metalwork, some various internal hook-up wires, nylon standoffs to support the board(s) once installed, and a length of 0.5mm solder. On completion of the modification and re-fitting the unit to the vehicle, there is absolutely no visible evidence of any departure from factory stock – nobody will know until you turn up the volume control.

The operation of the internal amplifiers remains unaffected, so if the time comes to move the car onward but you'd rather hold on to the "external" components of your system, the standard connections can be restored to the door speakers, and the unit will continue to function as it always had.

The work involved does require some moderate soldering skills, and a generally handy nature with hand tools. Do not underestimate the potential for damage to occur – there are several connections that need to be soldered to the base unit PCB, which is heavily populated with "Surface Mount" components. As a general guide, if you've ever fitted a "mod chip" to a Playstation (or especially a PS2!) you will have little or no trouble with this aspect.

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The writer assumes no responsibility whatsoever for any damage of any kind suffered as a result of attempting this modification. Also be aware that any sub-assembly that has been modified will no longer be covered by the manufacturers warranty. If this modification is done without taking the proper care, any resultant damage – either immediate or future – is the responsibility of the individual who performed the work.

Prior to commencing the modification, obviously the head unit itself needs to be removed from the car. This is most easily achieved by using either the "special tool" purchased from Blaupunkt themselves (around $20-25) or by using some stout wire bent as shown in the photo seen a couple of pages on, a total cost of…. Well, how much is a coat hanger?

Avoid using the thinner (~2mm) coat hanger wire – use one of the PVC covered coat hangers (about 3mm thick wire), and strip the PVC covering off .

In addition to the head unit though, the cradle also needs to be removed. This does entail removal of a few trim panels, but isn't that difficult once the location of Holden's "hidden screws" is revealed.

What you'll need:

There are a few essential tools to get the job done, and a couple more that are nice to have if you do. A roundup of the hand tools you'll need…

Screwdrivers – a couple of #2 Phillips head drivers including a "stubby", a couple of flat blade drivers are also handy. A set of jewellers screwdrivers are important also.

Torx drivers – a set of miniature Torx drivers are essential, specific sizes you'll need are T-8, T-9, and T-10.

Wire cutters/nippers – you'll need a decent quality pair of miniature sidecutters, in good condition.

Needle files – Whilst not absolutely essential, these are very useful for cleaning up the cradle metalwork following the cutting of the slot. A larger file can be used, provided adequate care is taken. (an ice cream stick with emery paper is a good substitute)

A "Dremel" style rotary tool – It doesn't have to be a genuine Dremel (mine isn't!), but a similar style tool with a thin metal cutting disc attached.

Power drill – A cordless is fine, and you'll need some drill bits. Specifically, 2.5mm and 5mm. The bits need to be in good condition, and sharp. Incidentally, if you have a drill press this is even better. A 1mm bit with a "pin vise" makes registration of the external cable assembly much more accurate also – explanation further in the text.

Soldering iron or station – I'm not talking about the one you do the plumbing with, you'll need a good quality iron which is designed for electronics work. It'll need to be fitted with a very fine tip, as some of the soldering points are quite small and the heat doesn't transfer well from a larger tip. Additionally there is a severe risk of damage to the main PCB in the head unit if an inappropriate soldering tool is used.

Hot-melt glue gun – the miniature ones are the best (the glue sticks are only around 6-7mm diameter) but a standard sized one will work as well.

Epoxy adhesive – the slow set type is recommended, although the 30 minute variety should be adequately strong. The reason for this recommendation is that the slower setting epoxies generally form a stronger bond than the 5 / 10 / 30 minute varieties, but six hours can be a little long to wait in certain circumstances. The cure time can be shortened somewhat by gently warming the joint during cure (say with a fan heater set to low heat positioned a couple of feet away) but bear in mind that by introducing heat you're probably sacrificing some of the strength.

Scrap wooden block – whilst drilling the cradle metalwork it is important to support it to avoid bending and potential misalignment later on. The block needs to be long enough to reach from the back of the cradle to

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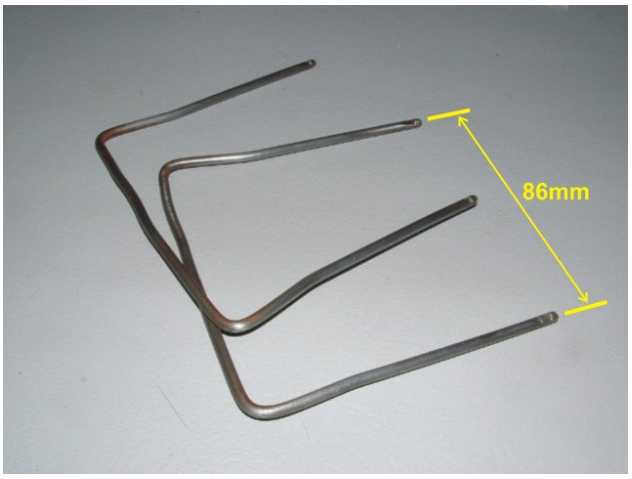
the front, with a few extra centimetres (the holes are drilled from the back of the cradle's rear panel), and wide enough to provide stable support for the cradle.

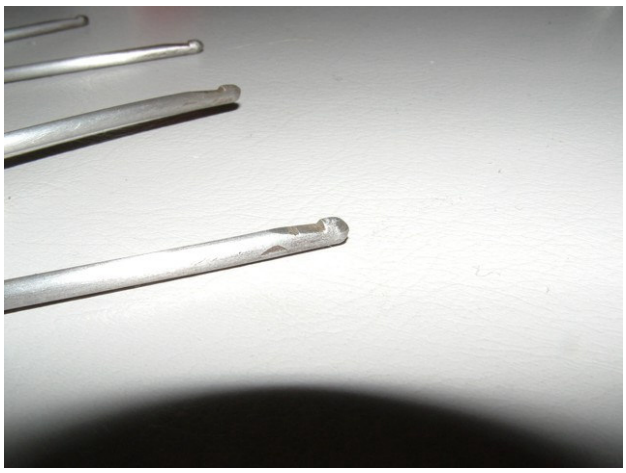
Solder Wick (de-soldering braid) – Braided copper strands a few mm wide used to absorb excess solder during rework. It will help the job go a lot more smoothly.

Coarse grit emery or other abrasive paper – only a small scrap is needed, something around 80 – 100 grit is perfect.

Here's a couple of photos for reference.

The photo on the left shows the soldering tool I use, with the extra tips I have for different jobs. The tip second from the right is the one I most commonly use. (the marker is there for scale)





The above photos detail the extraction wires for the head unit. Notice the notch about 3-4mm from the end – this helps the wires to get a bit more "purchase" on the locking clips to assist with removal. Without these notches, the wires just tend to pull out of the unit rather than pulling the unit out of the cradle. The clips in the head unit which are pushed aside by these wires have a small "tang" pressed into them, and these notches allow a firm purchase on these clips and therefore the rearward force on the wires is transferred to the unit itself.

Make certain also that you have a clean and well lit work area. This can't be done with the gear "sitting on the boot". Something soft to place things on whilst you're working on them is also very handy, and helps avoid scratches and so on. *(I use a piece of anti-static foam about 45cm square)*

Static – there's a good point. Much of the circuitry inside the head unit is sensitive to static electrical discharge. Avoid wearing synthetic clothing, and don't shuffle your feet around on the carpet just before diving elbow-deep into the unit, otherwise you might blow something up without even realising it. A good habit to get into is to touch something that's earthed after sitting at the work bench and before touching the item being worked on. This will eliminate any static charge you might have picked up.

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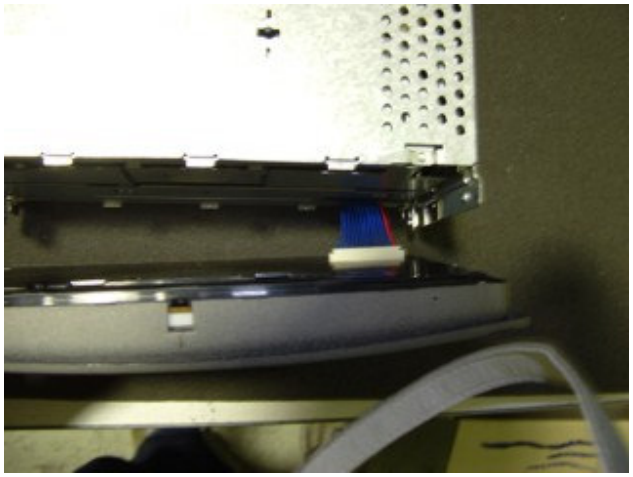
Getting on with it:

OK, enough of the preamble - Let's make a start.

The very first thing to be done is to remove the head unit. Grab your "special extraction tools" and head out to the car. Insert the wires into the holes on either side of the front panel making sure the notches face toward each other. Push them in all the way until you hear a distinct "click" and all four of the wires are pushed in as far as they can go. If you use wires without the notches filed out, apply some outward pressure to the "handles" (away from each other) and pull backwards. If it's the first time the head unit has been removed it can be really difficult – you need to be pretty firm, some would say even brutal, but it will come out. If the wires tend to be pulling out of the unit, grab the file and spend five minutes on filing the notches in the wires. My wires work every time, in a few seconds – literally.

With the head unit removed, I recommend taking it straight to the bench for stripdown and attaching the auxiliary socket. In this way the epoxy can be getting on with curing whilst you get on with trim and cradle removal and the metalwork modification.

To begin stripping the head unit, remove the four T-8 screws from the sides along the edge of the plastic moulding (2 each side) which anchor the facia to the chassis. Pull the facia panel away from the main body slightly, but not too far. Once enough clearance is obtained, reach between the facia and the main body and unplug the connector near the bottom right. *This can be tight – avoid excessive side-to-side "wriggling" or solder joints may be fractured.*



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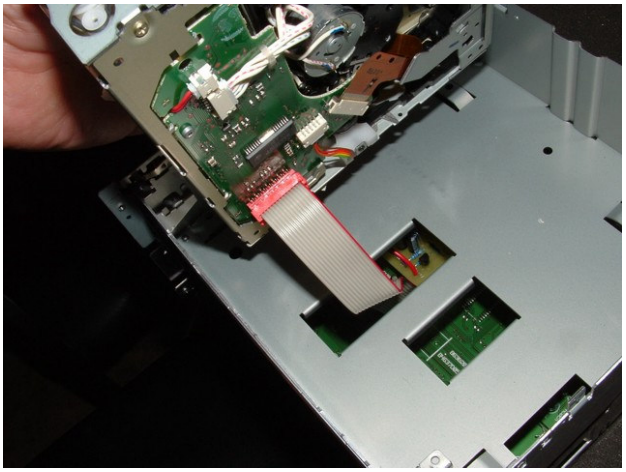
The following step is only required in the case of single disc player versions. If you have the six-stack unit, skip to the next section.

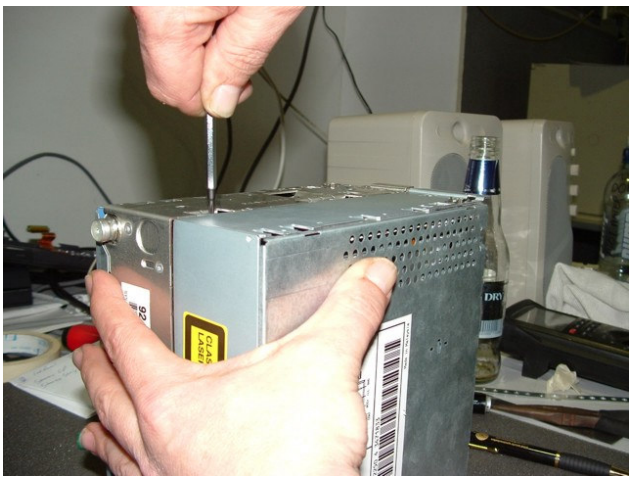
Single disc player units vary slightly in the stripdown procedure. Begin by removing the top cover of the unit – remove the two T8 screws along the front edge then lever up gently with a flat blade screwdriver. Now remove the four T8 screws holding the CD drive mechanism in the chassis, and carefully lift the mechanism up to access the connector (the red plug at the end of the grey ribbon cable) and unplug it carefully. Note that there's a locating peg to ensure correct reconnection.

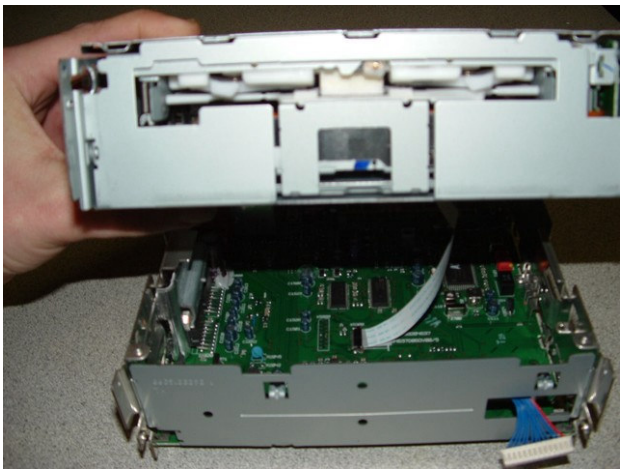


Six-stack owners resume here…..

Note: The six-stack CD models have a locking ribbon type connector accessible from the inside of the base unit. The socket lock must be disengaged before completely separating the two halves of the main unit. The procedure for this will be outlined shortly.

Along each side of the main assembly there are two T-10 screws (four in total). Remove these and separate the top half of the chassis if a single player, **but lift the top section only a little if it's the six disc unit.**





With the chassis resting upright on the work surface (ie. The normal position), lift the top section up slightly, but only enough to allow access to the internals. Here's where the six-stack guys have to be careful, as the ribbon connector assembly can be easily damaged. (photo shows the six-stack model) Use a small flat tip or jeweller's screwdriver to ease the lock tabs one at a time into the "unlocked" position (refer to the photo next page for clarification) and disengage the white ribbon cable from the socket. At this point the CD player section can be lifted away and set aside. Now turn the base unit over and remove the bottom cover plate after removing the two T8 screws.

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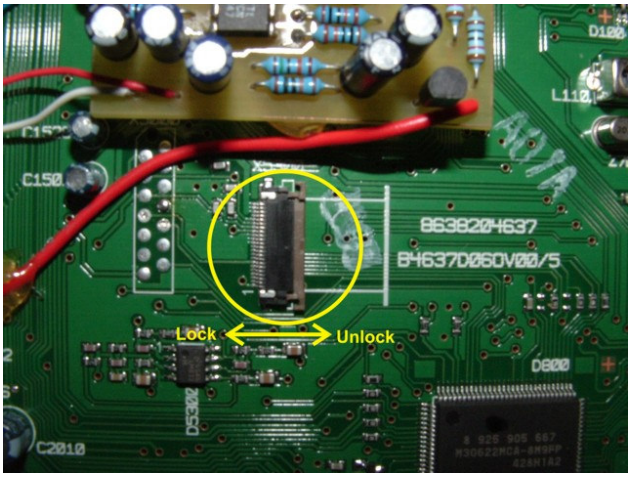
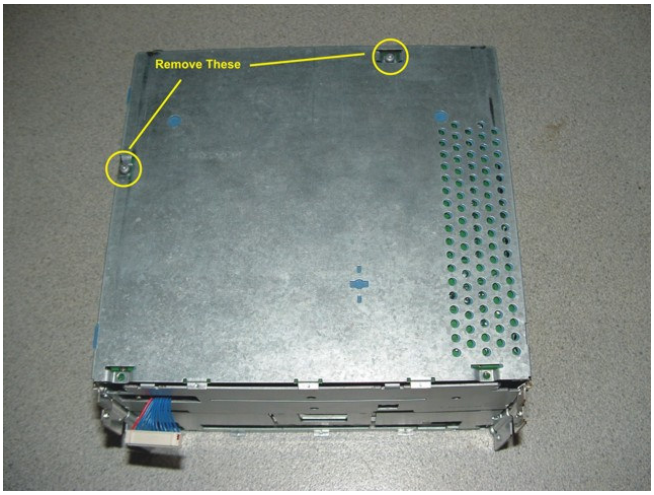


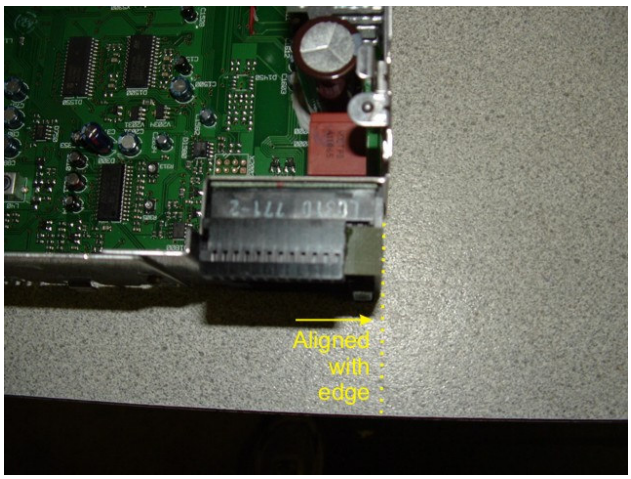


The photo on the left shows the locking connector used for the six-stack CD player connection. (with the ribbon cable removed) The brown coloured part of this connector slides left or right to locked/unlocked positions respectively. Move this to the unlocked position before withdrawing the cable, and make certain it's in the fully unlocked position when reconnecting the ribbon cable during reassembly.

(Please ignore the additional PCB shown mounted in this photo. It is of an earlier prototype.)

Now we need to attach the auxiliary socket to the head unit. Incidentally, both this socket and the mating pins mount in what is normally void space. The upshot is that a non-modified head unit can fit into a modified cradle, conversely a non-modified cradle will accept a modified head unit.

Use a small piece of fairly coarse grit sandpaper (say 80-100 grade) to roughen and "key up" the top surface of the existing black connector body. Brush off the sanding residue and preferably give the surface a wipe with some solvent such as acetone or lacquer thinner. Don't go crazy with the solvent though, you might start dissolving the connector body! Just a slightly moistened clean cloth to remove surface contamination is all that's required. Naptha (lighter fluid) is another excellent solvent, which in fact won't attack the plastic body and evaporates completely. Also give the bottom surface of the auxiliary connector a wipe with the solvent. (avoid using paper towel/tissue, as this can leave small fibres behind which may interfere with the bond)



Mix a small amount of epoxy adhesive – make sure you mix it thoroughly – and apply a little to the bottom surface of the auxiliary socket and to the roughened area on top of the black connector body. Don't use so much that it oozes out and runs all over everything, but apply it to both surfaces otherwise there may be voids in the final bond which will adversely affect the strength. Align the edges of the auxiliary socket mounting plate with the edges of the main connector body and press it down fairly firmly to squeeze the air bubbles out. Make certain too that the socket is sitting flat down against the black connector body. If you

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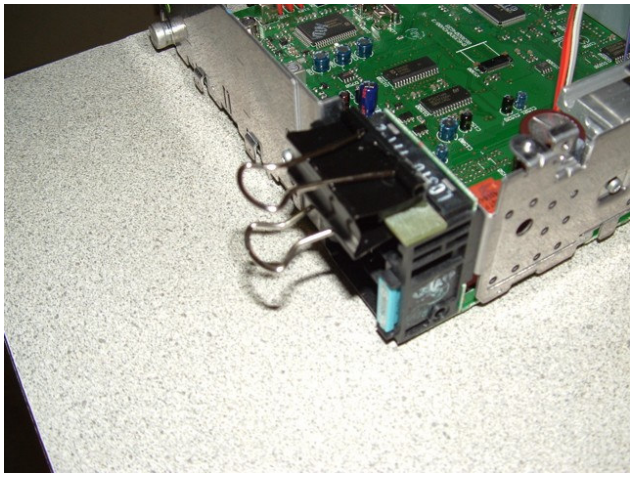
have a close look at the “step“ on top, there’s a small raised section a couple of millimetres wide – make sure the socket isn’t sitting up on that, but is pushed back against the edge of that step.



Apply an appropriately sized fold-back paper clip to clamp the arrangement together, and check the side and back alignment again making sure that the edges of the socket mounting plate are lined up correctly. Now set this aside to allow the epoxy to cure. As mentioned this can be accelerated somewhat by using a fan heater on the low setting, but heating the epoxy during cure does sacrifice some strength. It can also allow the epoxy to “creep” a little, so make certain that the unit is sitting horizontally and not on an angle.

Note: It’s always preferable to let the epoxy cure by its own means. If it can be planned that the head unit be removed the night before the remaining work is to be done, this preliminary work can take place and the adhesive allowed to cure without too much impact on the total job time.

Now we can get back to the car and begin removing the necessary trim panels, and extract the cradle from the dash. Begin by removing the centre of the console between the seats. In the coin tray in front of the gearstick/shift lever, feel around – there’s a single Phillips head screw that needs to be removed. It’s off centre, biased towards the right side. (Note – the factory fitted SatNav screen mounts here also, you’ll need to remove the bezel before commencing) Remove this screw, then open the lid of the CD storage bin – at the front edge you’ll see a small rectangular hole. Insert a large-ish flat blade screwdriver in there (doesn’t have to be long, but a nice wide tip – I’ve used a stubby here) and gently lever backwards. This will release the first of the clips holding this panel in. Work forwards using a screwdriver GENTLY and pop the clips out all the way along on both sides. As you’re able to lift the back part of this panel up, you can reach underneath and unplug the connectors to the window switches and Traction Control / ESP button where fitted.

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NOTE: Just about all the electrical connectors have a release tab on them. DON'T just yank on the wires, you need to press the lock tab before the connector will pull out.

Once the electricals are unhooked, the centre panel can be lifted clear of the console.

Now turn your attention to the centre panel in the top of the dashboard. (some models may have an additional gauge binnacle here) This unclips by levering on the front edge – if you can't get enough purchase on the edge with your fingers, use a stubby flat blade screwdriver or similar. Be careful not to scratch or mar the plastic panel. Once the clips at the front are released, then pull back to release the clips at the rearward edge. *(Note: If the additional gauge binnacle IS fitted, this must be removed by levering up the **rearward** edge – ie, the edge closest to you)*

There are six screws holding the trim panel – four at the top (above right photo), and two at the bottom.

Remove these screws (you'll need a stubby Phillips head driver for the two nearest the windscreen) and pull the centre panel away from the dash. You'll need to unplug the connector for the hazard switch, and those associated with the electronic climate control where applicable.

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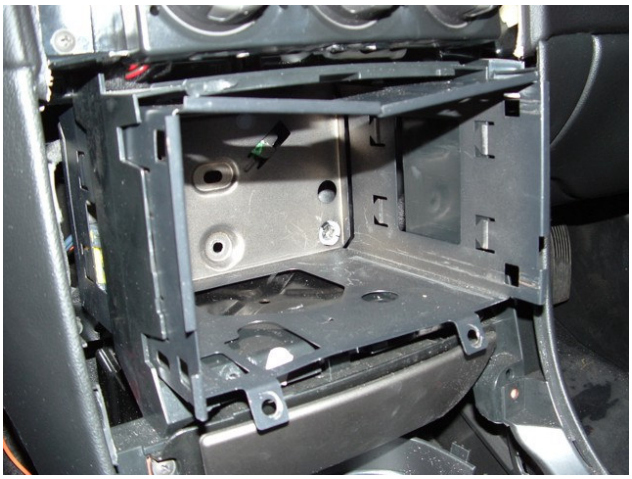
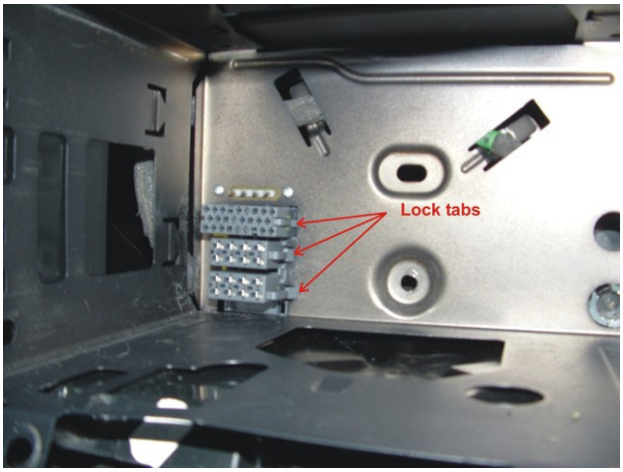
Now remove the two screws holding the tabs on the cradle metalwork at the bottom, and a single screw from the bottom centre of the back of the cradle. (Don't remove the single screw in the centre at the front, that's holding the storage bin underneath.)

The next part is a bit tricky – because there are "wedges" pressed into the metalwork which clip the cradle into the surrounding mouldings in the dash, you need to bend the top panel down slightly, and the bottom panel up slightly, whilst pulling the cradle back toward you. The top and bottom panels of the cradle *will* get bent, there's not much else we can do about it. Once it's out they can be straightened easily anyway.

Again this is another of those situations where you mustn't pull too far, because you need to release the tabs which retain the connector sockets. Once you have the cradle pulled out 3 or 4 cm, reach inside and release the tabs for the connectors at the bottom left and push them clear. *Note how the connectors hook into the punch-out in the metalwork – on the right hand side are the release tabs, but on the left side there are channels in the plastic plug body which hook over the edges of the punch-outs. Make certain when you refit the plugs that these channels are correctly engaged into the edges otherwise the plugs won't line up correctly.*

Now slide the cradle the rest of the way out and unhook the antenna cable from the retaining tabs, then press the release clips holding the antenna socket. The cradle can now be completely withdrawn and taken to the bench.

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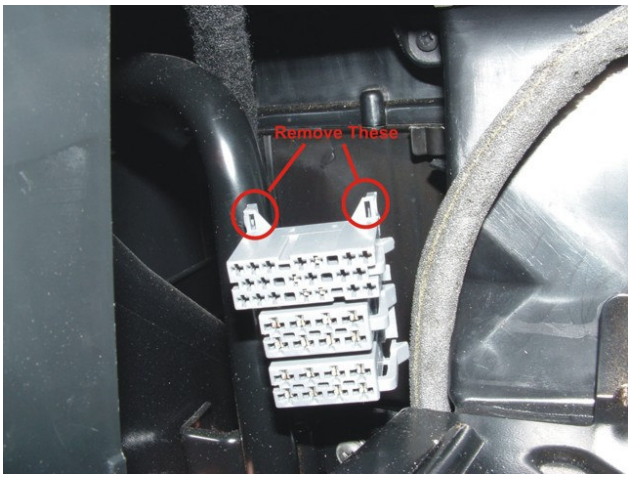

Now is a perfect time to cut off the “ears” on the top of the harness connector. They seem to serve no useful purpose, and in fact get in the way of the pin assembly you’re going to mount there. Cut them off flush with the top of the connector with sidecutters or a trimmer knife – ***carefully***.

However, we’re not quite finished with trim panels yet. The console lower side panel on the left side must be removed to allow routing of the lead-out cables, and to allow re-fitting of the connector sockets once the cradle is refitted to the car. (it’s a lot easier to press them back into position from behind the assembly) Firstly though the glovebox must be removed. Don’t worry, it’s not as hard as it sounds.

(Note: Left hand drive cars will not require glovebox removal, but you may have to remove the flip-down panel below the steering column.)

First empty it out, then lift the glovebox slightly off the bottom stops. On each side you can see the rubber wedge shaped stoppers – ease the bottom edge of these towards the inside of the glovebox, and slide them downwards to remove them. Now allow the glovebox to drop all the way down, then grasp the top edge and pull it towards you – it should pop out of the hinge clips at the back on each side.

Now remove the two screws retaining the front mounting flange on the lower console panel, and the single screw about halfway along the bottom edge of the console. You need to slide the passenger seat all the way back, and it’s still hard to get to. With these screws removed the lower panel should now lift away.

At this point, grab a cup of tea or coffee and have a break – you’ve done well!

While you’re having a breather, check on the progress of the epoxy. With any luck it will have started to gel off now. It might still be sticky, but should be starting to firm up. Now leave it alone again.

OK, we can start working on the cradle. Take the printed template and peel back the release sheet from the bottom but only 10-15mm. Fold the release sheet back against itself and crease it down firmly. Now line up the cutout in the template with the top cutout in the back of the cradle and press down the template where the release sheet has been removed. When this is nicely stuck down, peel the release sheet the rest of the way off and rub the template down firmly. (support the inside rear panel of the cradle when you do this, or it’ll bend)

The rounded rectangular area printed on the template is the metal we need to remove. Begin by gently centre punching the crosshairs at each end of the slot and pilot drill these with a 2.5-3mm bit, then run through with a 5mm bit. Again, support the cradle from the inside whist doing this.

Use a rotary cutting tool, and remove the strip of steel in between the lines. Try not to cut outside the lines, we don’t want to remove any more metal than we need to. Now the template can be removed and the edges of the slot cleaned up with some needle files. Make sure any flash from the cutting and drilling operations is removed - should it become dislodged later it could cause shorts.

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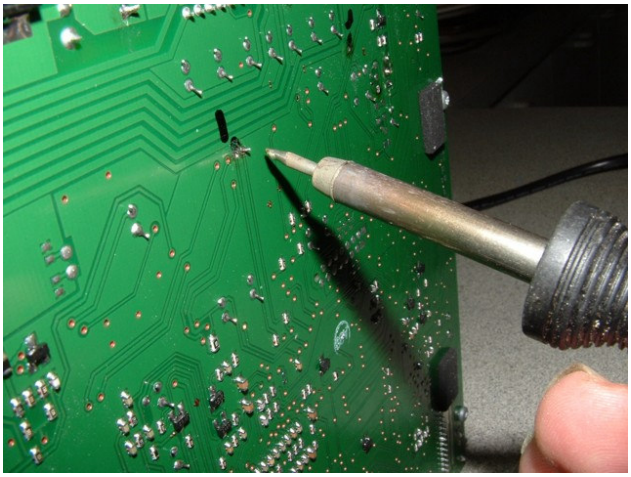
At this point take the pin/lead-out cable assembly and make certain that the pins fit through the slot with a little clearance all around. ***Don't drill the holes for the mounting screws yet though, that comes later.***

The time has come now to turn our attention back to the head unit. Before actually mounting anything, it's a good idea to prepare the points on the PCB in the base unit we are going to connect to. The section immediately following refers to the installation of the low-level output buffer, the Auxiliary Input switching board follows later in the text.

The buffer (output) board:

Appendix A shows a detailed photograph of the area of the base PCB we're concerned with for most models, as well as details of the corresponding points on the buffer board. For those with the "Premium" sound system (such as Calais and some HSV models) refer to appendix B to identify the connection points and any other mounting differences. If you look closely you can see that we're actually going to pick up these connections at vias on the PCB. (a "via" is simply a plated copper sleeve passing through the board to connect tracks on one side to the other) Due to it being copper, we're easily able to solder to it – but to make it a little easier still, it's best to "tin" the via with fresh solder, then extract that solder to clean the hole out before poking the connecting wire through it.



The easiest way to tin the vias is to thread some 0.5mm solder through the hole from the top side, then apply the iron from the bottom. (set the unit on its side so the PCB is vertical) Leave 2-3mm of solder poking through, bring the iron in contact with the via (melting the solder on the way in) then feed a further 2-3mm of solder in from behind as it melts. This will fill the via with solder of course, but then use some solder-wick braid to remove it. In really stubborn cases where the via won't clean out, use a pointed toothpick – heat until the solder melts, and poke the toothpick through from the other side. Once the solder solidifies again, pull out the toothpick.

Refer to the appendix and tin each of the vias indicated as applicable. The point for the +12V connection in standard single and six stacker units will be already tinned, and will simply need the solder cleaned out. (make sure you get the correct point for this connection – there are pads very nearby which look the same but are not!) Premium system owners must pick up power from the bottom side of the PCB – refer to the appendix.

Take care when you're tinning the vias – if too much heat is held in contact for too long, the bond holding the via can fail, and it can become dislodged.

Take the buffer board and determine where it will be mounted. There's plenty of space, just make sure it won't get in the way of the connection points for the CD player – you want to be able to reconnect that when the job's done. I recommend the location shown in the photos that follow, as it keeps the wiring as short as practical and is well enough out of the way. Once the position is determined, use hot melt glue to attach the three nylon standoffs to the base unit PCB – the position isn't critical, just make sure they don't interfere with components on the base board and will provide adequate support to the buffer board. It doesn't matter if some of the hot melt glue gobs over the components on the base PCB, just make sure the standoff itself isn't sitting on top of any components. Don't glue the buffer board to the standoffs yet though, we need to sort out some internal wiring.

Supplied in the kit are some short lengths of thin hook-up wire – a red and orange one joined together (for the right channels front and rear), a white and grey one joined as well (for the left channels), a single purple wire (for the standby signal), and a single red and black wire (12v supply and ground). The shielded output cable and remote output wire have already been attached to the buffer PCB.

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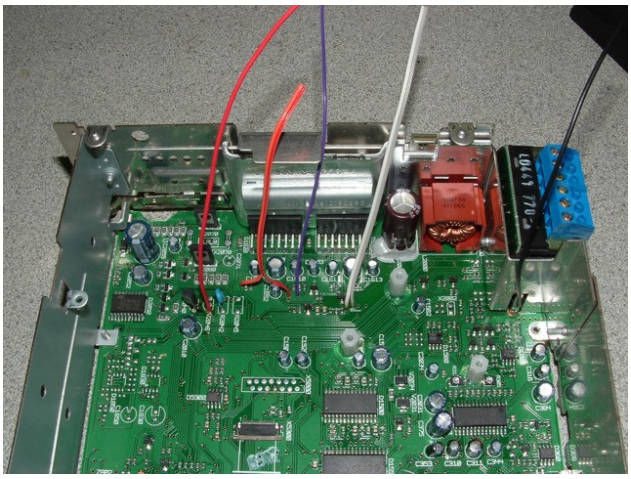
The method I've found easiest for the connection of the input wires is as follows.

Strip and dress one end of the hookup wires (ie. twist the strands together) and I recommend lightly tinning these wires so the strands don't fray out. Insert these ends through the corresponding vias and solder them into the base PCB. Work carefully, in some cases there are some other components in close proximity to these connections. Don't install a fault while you're at it! Inspect these joints carefully and clip off the excess wire. If the Input board is to be installed as well, solder one of the red power wires to the +12SB point on the buffer board. (this provides switched power to the Aux In board)

Note: If you're installing BOTH PCBs, attach the wires for the Aux In board as well (description further on). If the buffer board is mounted in place first, you can't get to the points on the base unit PCB to make the required connections.



In this photo the buffer input wires have been attached to the relevant points, the "standby signal" wire (this triggers the remote power output signal), and the red and black wires connected to the +12v and ground points. (note the ground connection point – this is as good as any) Also note that the standoffs have been attached to the base PCB with hot-melt glue.

Notes: Ignore the blue coloured connector shown in this photo, this is again an earlier revision. Also, Premium sound system owners, please refer to appendix B for locations of wiring connections and standoffs.

The wiring colour convention I use is as follows. It works for me, but feel free to use whichever you like. It is recommended though is to route the signals the way I have – ie, channel numbering 1 to 4. In this way the colour coding scheme I have used helps prevent unexpected balance/fader operation. The routing I used is…
(NOTE: Colours shown in parentheses are for alternate output cable)

Channel 1 (Rear LEFT)	-	GREY input wire	-	BLACK (green) output wire
Channel 2 (Front LEFT)	-	WHITE input wire	-	WHITE (blue)output wire
Channel 3 (Front RIGHT)	-	RED input wire	-	RED (red) output wire
Channel 4 (Rear RIGHT)	-	ORANGE input wire	-	YELLOW (yellow) output wire

(Note: The RED wire referred to above is the red signal wire, not the slightly thicker one supplied for the +12V connection)

Now rest the buffer board on the standoffs, and cut the wires to length. Don't forget to allow a little extra, as you need to manipulate the board a little after the connections are completed. DON'T cut them too short! Strip about 4mm of insulation from each one, and again twist the strands and tin them.

Firstly connect the input wires 1-2-3-4 to the buffer board inputs, followed by the standby input. Insert the dressed end through the hole in the PCB and solder it to the associated pad. After the input wires, connect the red +12V wire, and lastly the black ground wire. To attach the ground, tin the "tab" part of the shield around the main connector where it's soldered to the PCB. Also strip and tin the end of the ground wire, then "sweat solder" the tinned end to the tinned shield.

Don't forget to clip the excess wires from the PCBs at BOTH ends once soldering is completed. (at the base-board end, these wires could short to ground or to each other potentially causing significant damage) If the Aux In board is to be installed in conjunction, also attach the +12SB wire. Make sure the off-cuts don't fall into the unit!

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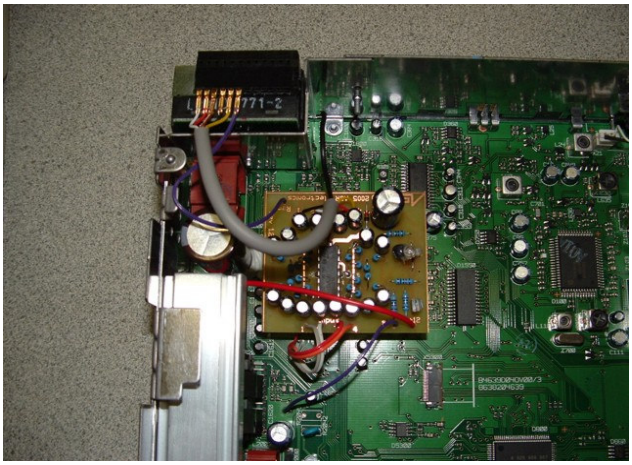
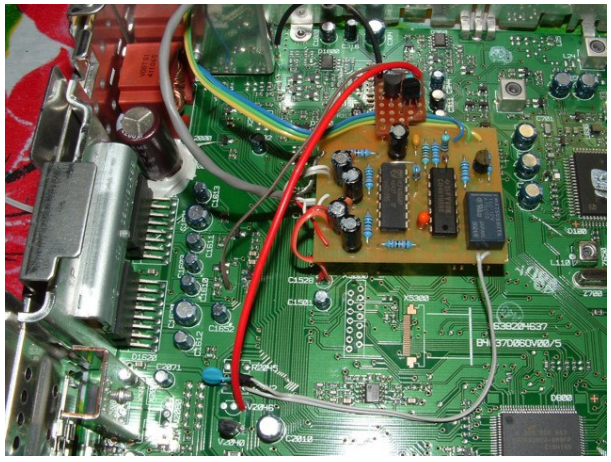


A blob of fresh hot-melt glue can now be applied to the tops of the standoffs and the buffer board set in place. The connector pins have also been partially inserted in the photo.

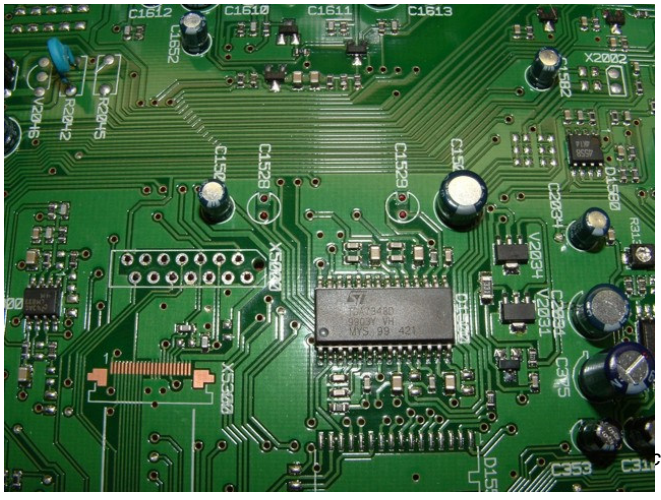
At this point if you're not installing the Aux Input switching board as well, skip over the next section and proceed to the following one.

Auxiliary Input PCB:

There are two different connection schemes, depending on whether the input board is installed on its own, or in conjunction with the output buffer board. The power switching is performed by the output buffer, therefore in these installations the input derives switched 12V from the buffer board. If stand-alone, the input board has a small additional "daughterboard" to perform the power switching. Look at the photos below for a view of the completed installation in each case.



Again, pairs of colour coded wires are supplied for the signal connections – red/orange for the right channel, and white/grey for the left. (at this point there is no front/rear, the fader function is applied further on in the signal chain)



The capacitors C1528 and C1529 must be removed from the base unit board and these wires soldered in their place. (refer to the photo – differences exist between standard and premium, but they're very close in this section) The leads of the capacitors have been bent over slightly during manufacture, and this makes them a little difficult to remove – begin by working from the bottom of the PCB, and using a small flat tip jeweller's screwdriver in conjunction with the iron melt the solder on each joint and use the screwdriver tip to

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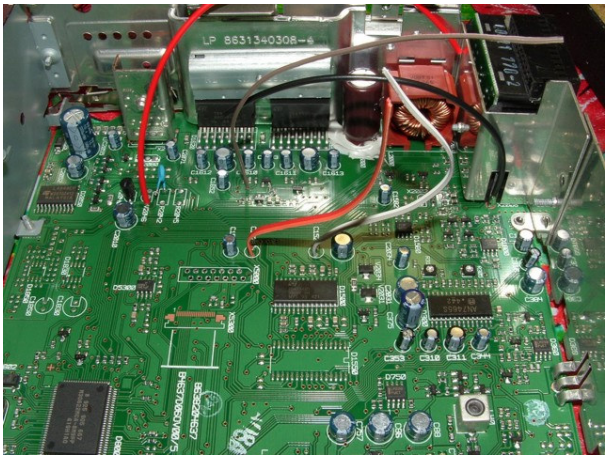
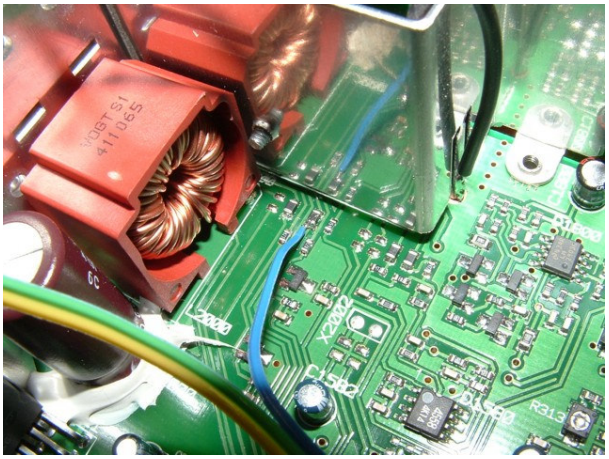
straighten the lead before removing the component from the board. Solder the white hookup wire to C1529 “+”, and the grey wire to C1529 “-”. The red hookup wire goes to C1528 “+”, and the orange to C1528 “-”.

If the installation is input only, you’ll also need to connect the Constant +12V and the Standby wire. The photo below left shows these wires attached to the base unit PCB.

(note that a brown coloured wire has been used for the standby signal for the standalone input mod, whereas purple wires have been used for the output buffer standby connection)

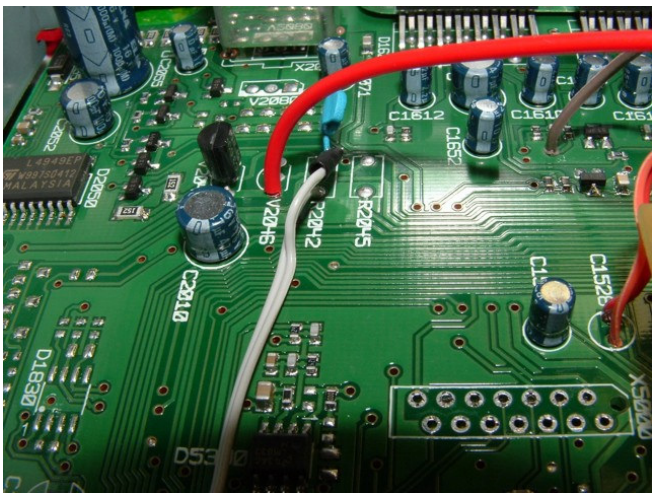
There must also be a connection made for the telephone MUTE signal, solder the blue wire from the Aux PCB to the point indicated in the photo below right. (Refer to Appendix B for Premium systems) Be very careful when soldering this connection – this is the only one which can’t be picked up at a via, so there’s no hole to poke the wire through. It must be soldered directly to the surface mounted link and if too much heat is applied you can lift the component completely off the board, or if the bared end of the wire is too long it could cause a short.





Now after determining where the board will be mounted, hot-melt glue the standoffs to the base unit PCB in readiness to mount the input board. Don’t mount it yet though, you need to solder the connections! Cut the wires to length allowing a little slack, strip about 4mm of insulation from each, twist and tin the strands, then solder them to the appropriate points on the input board. There’s the signal wire pairs, the +12V and Ground wires, and the standby signal if stand-alone. To attach the ground, tin the “tab” part of the shield around the main connector where it’s soldered to the PCB. Also strip and tin the end of the ground wire, then “sweat solder” the tinned end to the tinned shield. Cut the excess wire off, and hot-melt the board to the standoffs.

Note: If you’re powering the input board from the buffer board, the +12SB connection on the buffer is the one used for the +12V supply to the input board.



The antenna inhibit must also be applied (for vehicles which have an external antenna for the radio) by lifting one leg of the thermistor R2042 (the small blue disc-like thing near the +12V connection) and soldering the Ant Inhibit wires to these points – one to the base PCB, and the other to the thermistor lead. Slide the small piece of heatshrink over the wire before soldering to the thermistor lead so it can be insulated when the connection is complete. (the antenna inhibit wiring in the photo is the grey coloured miniature figure-8 wire, the kit may have black mini fig-8 supplied)

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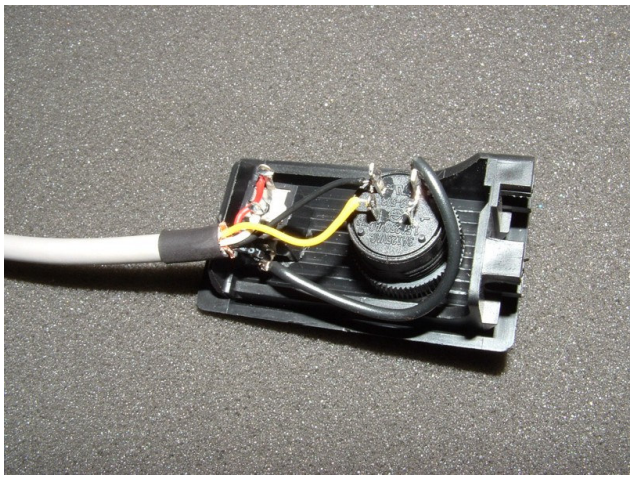
We also need to mount the 3.5mm socket and activation switch somewhere. You'll notice that these items attach to a short length of cable with a 5 pin connector – this has been done such that the trim item where the socket and switch are mounted can be removed from the car without being tied to the Aux In cable attached to the back of the cradle. The socket has been soldered to the cable, but due to the switch having to mount through the panel, these connections must be soldered after mounting. This switch may also be substituted with an alternative switch (Holden sell a "Lighting Blackout" switch which is suitable), but whichever switch is chosen it must be an "alternate action" type, not "momentary contact". (in other words, the switch must toggle between button presses – press once to make contact, press again to break.) Also, the included switch has a LED inside to indicate when the Aux input is active – if you choose to use an alternative, you might also wish to consider an alternative indication LED mounted somewhere.

Locations for switch/socket mounting – Some will choose to use the small square panel behind the window switches. In this case, a template has been included with the kit to use as a guide for drilling the holes. Another much more invisible location is the small "corrugated" panel inside the console storage bin. In some models a lamp is fitted here to illuminate this space, but if not it's a perfect location. You'll have to be careful with the cable routing though, as this location is at about the full length of the cable. The photos below show the socket and switch mounted in this way, with a detail shot of the soldered connections.

Once the location is chosen, use the template if desired to align the position of the holes. Drill the hole for the socket to 6mm, and the switch hole to 16mm. (if using the switch provided) From behind the panel chosen, there is also a need to countersink the 6mm socket hole, as the barrel may not protrude far enough to fasten the nut.



Mount the socket and switch, then solder the black wire on the switch (this is the wire that's soldered to two terminals on the switch – the LED cathode, and one contact) to the socket ground connection where the shield of the cable is soldered. Now solder the yellow wire from the cable to the LED Anode (the switch terminal marked "+"), and the black wire from the cable to the other switch contact. This panel can now be re-fitted in preparation for the final hook-up.

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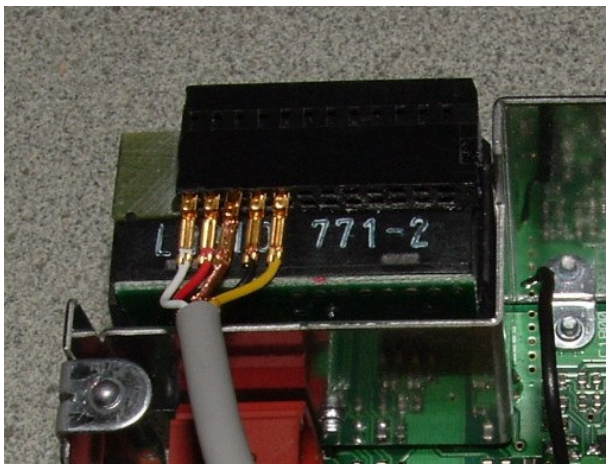
Finalising the work to the head unit:

OK, at this point the PCB(s) should be mounted in the base unit with hot-melt, and all the connections between the base unit PCB and the modification PCB should be done, we now need to insert the socket pins into the receptacle we epoxied to the original connector block. Note carefully that we're only interested in the top row – the dual row receptacle has been chosen purely for the physical spacing provided by the bottom row, it serves no other purpose. DON'T INSERT THE PINS INTO THE BOTTOM ROW!! ONCE LOCKED IN IT'S ALMOST IMPOSSIBLE TO REMOVE THEM WITHOUT DAMAGE.

Refer to the following photos to assist in identifying which pin goes where. When doing this, in cases where there are multiple pins in a common cable, don't insert any single pin fully. Insert all pins from the bunch just a couple of mm, and then slide each of them in a little at a time. Also make certain that you're inserting the pins the right way up – have a close look, there is a little bent-up "tang" on one side of each pin – this locks the pin into the receptacle via the little slot seen in the top of the receptacle body. When pushing the pin into the receptacle, avoid using a sharp metal tool such as a jeweller's screwdriver as this can weaken the wire at the connection point and it may break. I use a wooden toothpick – it has a nice pointed end, but won't damage anything.

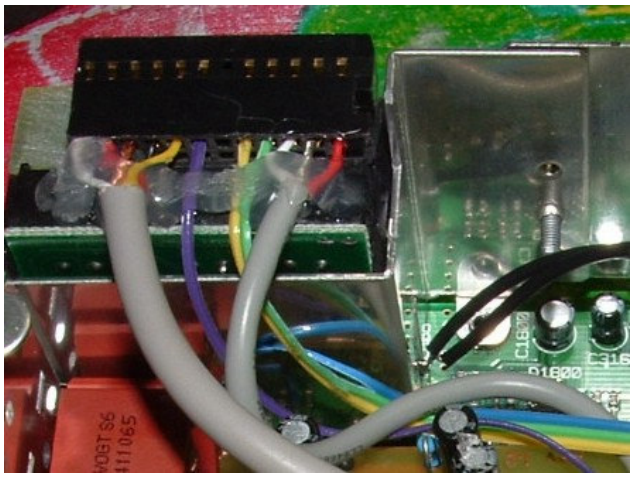


This shot shows the buffer PCB channel output pins partially inserted. From here they should be worked in a millimetre or so each at a time, until the pins are fully inserted. When they're in all the way, you can hear a distinct "click" when the tang on the pin springs up into its corresponding locking slot. Also look carefully when you're done to make certain all the pins are locked in properly.

Nominating the leftmost pin as number 1 (as viewed above), the connection scheme is as follows….
(colours shown in parentheses are for alternate output cable connection)

Pin 1	- Line out Front LEFT	- White	(blue)
Pin 2	- Line out Front RIGHT	- Red	(red)
Pin 3	- Line out gnd	- Shield	
Pin 4	- Line out Rear LEFT	- Black	(green)
Pin 5	- Line out Rear RIGHT	- Yellow	(yellow)
Pin 6	- Remote Out	- Purple	

Pin 7	- No Connection	
Pin 8	- Aux LED	- Yellow
Pin 9	- Aux Sense	- Green
Pin 10	- Aux in Left	- White
Pin 11	- Aux in Gnd	- Shield
Pin 12	- Aux in Right	- Red



You'll notice that pins 1-6 are related to the outputs, and 8-12 are for the Aux input. Once the wiring has been sorted out correctly and locked in, run a bead of hot-melt over the cables as shown in the photo to provide some strain relief.

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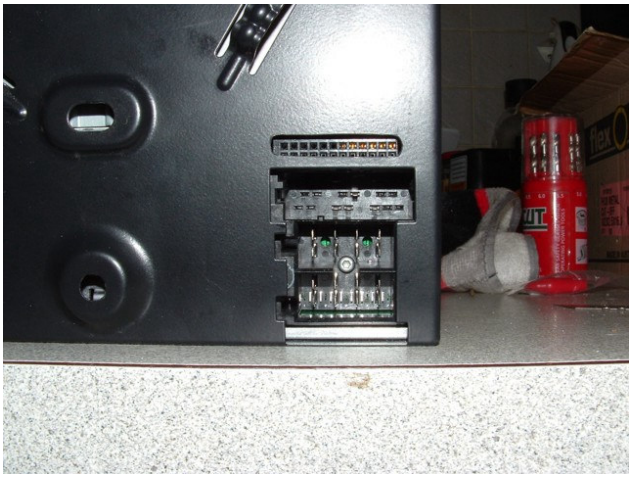
Normally I encourage people to run some tests before reassembling these kind of things, but unfortunately we're not in a position to be able to in this case. What we can do instead is to double – and even triple – check all our work. Make certain all the connections to the base PCB are the RIGHT ones. There are a lot of vias around the area, make sure you connected to the correct ones. Make sure you clip the excess wires from both PCBs when you've finished the soldering, and make sure those off-cuts didn't fall inside the unit to short something out. Pick up the base unit and give it a good shake, even use a clean paintbrush to brush any debris out. If you have an air compressor, all the better – give it a blast with the nozzle to blow out anything which might cause problems down the track.

When you're satisfied that it's all OK, you can go ahead and reassemble the head unit. It's basically the reverse sequence of the stripdown. This is where the single player guys actually have the advantage – just re fit the top half of the chassis, reconnect the plug to the CD drive mechanism, and screw it back in. With the six-stacker, firstly make totally sure that the connector is UNLOCKED. Getting the ribbon cable back in here can be a challenge, but be patient. Note that during the attempt to slide the ribbon back into the connector you might inadvertently re-engage the lock – make sure you haven't done this. It's virtually impossible to insert the ribbon when the connector is even partially locked. When the ribbon is properly engaged in the connector there should only be about a 1.5mm width of the ribbon's tinned contacts visible, and it needs to be square to the connector. When it's seated correctly slide the lock tabs to the "locked" position, and make sure both ends of the locking tab are in place. Replace the side screws, and return the bottom cover plate and the two screws associated with it.

Now the facia goes back on, but here's another trick – sometimes it doesn't want to sit back properly against the chassis. Well, along the top and bottom edge of the facia there's a slit about 1mm wide – on the front edge of the top and bottom cover plates there are small "tabs" poking out. If these aren't quite in alignment when you put the face back on, the tabs don't go into the slot. Wriggle things a little, or even encourage the tabs to drop into place with a jeweller's driver, but once they line up OK the front panel goes straight back on. Oh, don't forget to plug the connector back in first!

Now it's time to finish the work on the cradle. Slide the reassembled head unit into the cradle, and make certain that the slot is in the correct position so the receptacles in the socket are central. (refer to the photo. Note that these photos show an output only installation – the input mod occupies the additional connection points)



Now take the lead-out cable assembly and insert the pins into the socket. Hold the board down firmly against the back panel, and if you have a "pin vice" use a 1mm bit to mark the hole position on the cradle through the PCB as I have in the photo. If you don't have a pin vice, you could use your cordless drill with a 1.5 or 2mm bit. Don't drill right through though, for obvious reasons – we just need a starting point for the holes. Make certain that the head unit is sitting firmly against the bottom surface of the cradle – it can "sit up" a little when the unit is placed face down.

This part of the job MUST be done accurately - If the holes for the mounting screws end up in the wrong position, you won't be able to get the head unit back into the cradle!

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Now remove the pins from the socket, and take the head unit back out of the cradle. Drill the holes through the rear panel of the cradle to 2.5mm, and match the holes in the pin PCB also. De-burr these holes and fit the lead-out assembly to the cradle with the supplied 2.5mm screws. Insert the screws from the inside, and don't forget to use the lockwasher – if these screws come loose it's a pain to get to them to re-tighten. The photo at left shows how it should all look once it's put together.

Finally slide the head unit into the cradle once more to check the alignment of the socket and pins. If it all looks good, you can remove the head unit and re-fit the cradle to the car. (did you remember to cut the "ears" off the existing harness connector? If you didn't, you'll have a little trouble getting the connector to clip back in to the cradle firmly)

Before you begin sliding the cradle back into the dash, re-fit the antenna socket and run the cable through the retaining tabs. (there should be sufficient slack in the antenna cable to do this) Also feed the output cables through the back and run them behind the existing harness connectors. As you begin sliding the cradle in, gently pull the lead-out cables from behind/below so that they don't fold back on each other or otherwise interfere with the existing connectors. Don't slide the cradle in all the way yet, leave it sitting out by 30 or 40 mm so that you can reach from behind and re-fit the existing harness connectors. Don't forget about the correct seating arrangement for these – make sure the slits in the left side of these connectors are engaged properly over the edges of the cutout, then push the cradle the rest of the way in. Now reach from behind the cradle and press on the connectors until the locking tabs clip into position. From the left hand side of the console, wrap a cable tie around the lead-out cables and some of the existing wiring so as to provide some strain relief.

You can now return the screws holding the cradle in (don't forget the one at the back), and reassemble the console. You might want to leave the lower left side panel off though, until you get the amplifier signal cables run. Once reassembled the head unit can be returned to the cradle and powered up. Check all operations first before applying power to the amplifier(s) just to be sure. If it all looks OK, then crank it up!

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